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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/810,452

03/26/2004

Schat Sutardja

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EXAMINER

VU, BAO Q

ART UNIT

PAPER NUMBER

2838

MAIL DATE

DELIVERY MODE

10/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/810,452

Applicant(s)

SUTARDJA, SEHAT

Examiner

Bao Q. Vu

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5-21-07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-11 and 14-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-11, 14-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 2838

1. In view of the Appeal Brief filed on 5-21-07, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

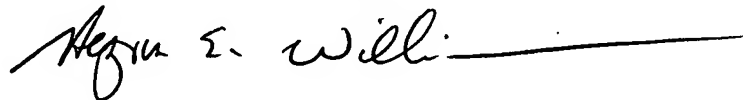
(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Hezron Williams

SPE AU2838

HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800



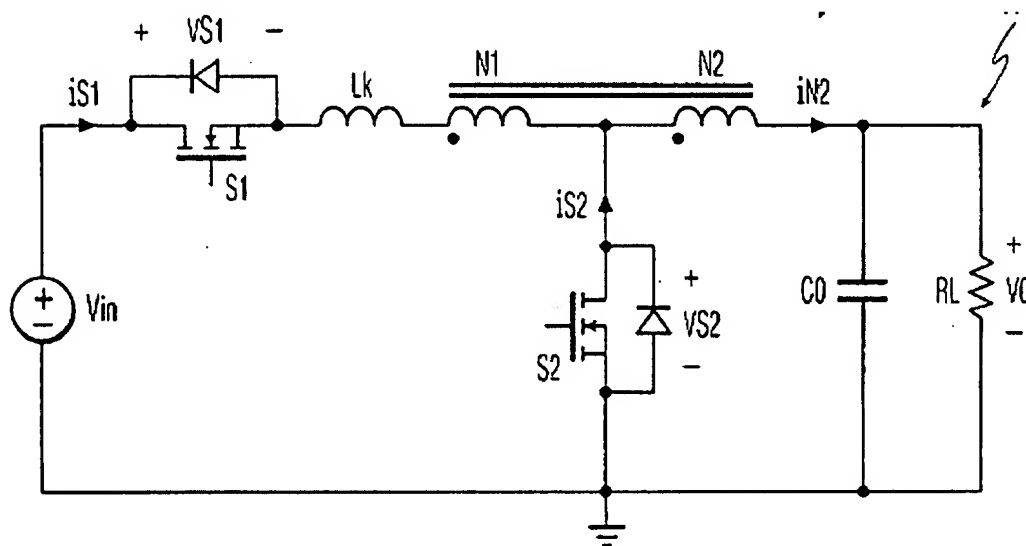
Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2838

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4, 5, 6, 9, 11, 14, 15, 16, 19, 21 and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Lu et al. (USP 5,636,107). Qian discloses the claimed invention a coupled inductor with first, N1, and second, N2, windings connected in series to form a common node, a conduction switch, S1, and a freewheeling switch, S2, the inductor is formed on a single core, and an output capacitor, Co. See figure below.



4. Qian discloses the claimed invention except for turns ratios of the inductor devices. Lu discloses that it is known in the art to provide the turns ratios of the inductor devices of having a relationship of the N1/N2 windings of the transformer to be 2. The turns ratio indicates the amount by which the transformer increases or decreases the voltage applied to the primary. For example, if the secondary of a transformer has two times as many turns as the primary, the voltage induced into the secondary will be two times the voltage across the primary. (As is with

Art Unit: 2838

the case of applicant's claimed invention). If the secondary has one-half as many turns as the primary, the voltage across the secondary will be one-half the voltage across the primary.

However, the turns ratio and the current ratio of a transformer have an inverse relationship. Thus, a 1:2 step-up transformer will have one-half the current in the secondary as in the primary. A 2:1 step-down transformer will have twice the current in the secondary as in the primary. (As is with the case of applicant's claimed invention).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the turns ratios of the inductor devices of having a relationship of the $N1/N2$ windings of the transformer to be 2 of L_u with the controlled inductive switching circuit of Qian, in order to provide a simplistic approach to control the output voltage and output current induced in the secondary by changing the turns ratio of the transformer.

2144.05 Obviousness of Ranges [R-1]

>See MPEP § 2131.03 for case law pertaining to rejections based on the anticipation of ranges under 35 U.S.C. 102 and 35 U.S.C. 102 / 103.

OPTIMIZATION WITHIN PRIOR ART CONDITIONS OR THROUGH ROUTINE EXPERIMENTATION

Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W] here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955) (Claimed process which was performed at a temperature between 40C and 80C and an acid concentration between 25 and 70% was held to be prima facie obvious over a reference process which differed from the claims only in that the reference process was performed at a temperature of 100C and an acid concentration of 10%). See also In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969) (Claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable there over because, among other reasons, there was no evidence of the

Art Unit: 2838

criticality of the claimed ranges of molecular weight or molar proportions.). For more recent cases applying this principle, see *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989), and *In re Kulling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990).

ONLY RESULT-EFFECTIVE VARIABLES CAN BE OPTIMIZED

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In *re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal. / sq.ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy).

Qian and Lu discloses the claimed invention except for having a transformer coefficient coupling of equal or greater than 0.99. It would have been obvious to one having ordinary skill in the art at the time the invention was made to a transformer coefficient coupling of equal or greater than 0.99, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The extent to which flux generated in one winding links the other winding is expressed in terms of the winding's coupling coefficient: a coupling coefficient of unity (1), implies perfect coupling (i.e. all the flux which links that winding also links the other winding) and an absence of leakage flux (i.e. none of the flux which links that winding alone). From a circuit viewpoint, the effects of leakage flux (inductance) are accounted for by associating an equivalent lumped value of leakage inductance with each winding. An increase in the coupling coefficient translates into a reduction in leakage inductance: as the coupling coefficient approaches unity, the leakage inductance of the winding approaches. Therefore it would have been obvious to one of ordinary skill in the art to use a transformer with coefficient of coupling near unity (optimum

value) if it was possible knowing the inherent inefficiencies of high leakage inductances associated with low coefficient of coupling which were not achievable at the time of the prior art as opposed to the present where high coefficient of coupling are achieved now near unity.

5. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Lu et al. (USP 5,636,107) and further in view of Boeckman et al. (USP 6,184,666). Qian and Lu disclose the claimed invention (see above paragraphs) except for the independently controlled parallel switches. Boeckman discloses that it is known in the art to provide the independently controlled parallel switches. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the independently controlled parallel switches of Boeckman with the controlled inductive switching circuit having a turns ratio of 2 of Qian and Lu, in order to reduce the heated generated by either switch when in operation to create a redundancy to handled higher voltages and reduces the failure rate of the switches.

6. Claims 10, 22, 20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Lu et al. (USP 5,636,107) and further in view of Yang et al. (USP 6,404,175). Qian and Lu disclose the claimed invention (see above paragraph 2) except for the parallel-connected voltage regulators with the phase controller. Yang discloses that it is known in the art to provide the parallel-connected voltage regulators with the phase controller. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the parallel-connected voltage regulators with the phase controller of Yang with the controlled inductive switching circuit having a turns ratio of 2 of Qian and Lu, in order

Art Unit: 2838

provide a controlled current sharing and current balancing techniques achieved by utilizing the parallel-connected voltage regulators with the phase controller.

7. Claims 8, 18 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Lu et al. (USP 5,636,107) and further in view of Dwelley et al. (USP 6,166,527). Qian and Lu disclose the claimed invention (see above paragraph 2) except for the on-time conduction controller with multi-level gate driver circuit. Dwelley discloses that it is known in the art to provide the on-time conduction controller with multi-level gate driver circuit. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide with the controlled inductive switching circuit having a turns ratio of 2 of Qian and Lu, with the on-time conduction controller with multi-level gate driver circuit of Dwelley, in order to provide a controlled switching scheme that conserves power by driving less than all the switches when the input voltage is higher or lower than the output voltage.

Response to Arguments

8. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

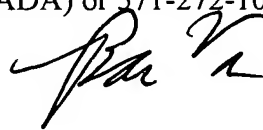
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao Q. Vu whose telephone number is (571) 272-2088. The examiner can normally be reached on Monday-Thursdays, 8:00AM- 6:00PM.

Art Unit: 2838

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Bao Q. Vu
Primary Examiner
Art Unit 2838

October 11, 2007